GH Phipps CONSTRUCTION COMPANIES

5995 Greenwood Plaza Blvd.
Suite 100
Greenwood Village, CO 80111-4710
303-571-5377
303-629-7467 (fax)

TRANSMITTAL

No. 12J2000-0141

PROJECT: Northwestern Mutual-West Denver Office Bldg

DATE: 12/19/2012

TO: Adams County Plumbing & Heating Co
2669 E Hwy 224
Denver CO 80229

RE: 238126-Split-System Air-Conditione

ATTN: Tamara Carhart

Ph/Fax: 303-288-4546 303-289-5756

JOB: 12J2000

WE ARE SENDING:	SUBMITTED FOR:	ACTION TAKEN:
☑ Shop Drawings	☐ Approval	☐ Approved as Submitted
☐ Letter	☑ Your Use	☐ Approved as Noted
☐ Prints	☐ As Requested	☐ Returned After Loan
☐ Change Order	☐ Review and Comment	☐ Resubmit
☐ Plans		☐ Submit
☐ Samples	**SENT VIA:**	☐ Returned
☑ Specifications / Product Data	☑ Attached	☐ Returned for Corrections
☐ Other:	☐ Separate Cover Via:	☑ Due Date: 12/18/2012

NOTES:

Item	*Package*	*Code*	*Rev.*	*Copies*	*Date*	*Description*	*Status*
Submittal	238126	238126.01	1	1	12/19/2012	Split-System Air-Conditioners- FCU-1- Fan Coil Unit- Product Data	No Exceptions Taken
Submittal	238126	238126.02	1	1	12/19/2012	Split-Split-System Air-Conditioners- FCU-1- Fan Coil Unit- Shop Drawings	No Exceptions Taken
Submittal	238126	238126.03	1	1	12/19/2012	Split-Split-System Air-Conditioners- FCU-2- Fan Coil Unit- Product Data	No Exceptions Taken
Submittal	238126	238126.04	1	1	12/19/2012	Split-Split-System Air-Conditioners- FCU-2- Fan Coil Unit- Shop Drawings	No Exceptions Taken
Submittal	238126	238126.05	1	1	12/19/2012	Split-System Air-Conditioners- ACCU-1- Air Cooled Condensing Unit- Product Data	No Exceptions Taken
Submittal	238126	238126.06	1	1	12/19/2012	Split-System Air-Conditioners- ACCU-1- Air Cooled Condensing Unit- Shop Drawings	No Exceptions Taken
Submittal	238126	238126.07	1	1	12/19/2012	Split-System Air-Conditioners- ACCU-2- Air Cooled Condensing Unit- Product Data	No Exceptions Taken
Submittal	238126	238126.08	1	1	12/19/2012	Split-System Air-Conditioners- ACCU-2-Air Cooled Condensing Unit- Shop Drawings	No Exceptions Taken

CC:

Signed: _____

Jennifer Lynn

3025 S. Parker Rd | Suite 1100 | Aurora | CO | 80014
(303)696-2602 | www.ssgroupinc.com

SSG MEP, Inc.

☒ REVIEWED ☐ FURNISH WITH CHANGES NOTED
☐ REJECTED ☐ RESUBMIT SPECIFIC ITEM(S)
☐ REVISE & RESUBMIT ☐ TRANSMITTED WITH NO REVIEW MADE

Actions taken by SSG MEP, Inc. with respect to the Submittal are only for general conformance with the design concepts of the Project based upon the Contract Documents. In all respects, SSG MEP, Inc. is subject to the terms and conditions of its contract with its Client. Notations, "corrections" or comments on the Submittal(s) do not modify the obligations of the contractor or its subcontractors from those set forth in the Contract Documents. Contractor shall field verify, confirm, correlate all dimensions, sizes and tolerances before construction or installation of any component or assembly begins. Unless otherwise specifically noted on the submittal, all fabrication, installation and construction means, methods, techniques, sequences, schedules and procedures remain solely the responsibility of the contractor. Contractor remains solely responsible for job site safety and all safety precautions and procedures. Notwithstanding anything else to the contrary, SSG MEP, Inc. by reviewing this Submittal does not assume professional responsibility for any design or work product (including but not limited to its technical accuracy or professional competency) provided by contractor or owner on a "design build" or "performance specification" basis. SSG MEP, Inc. provides no warranties, expressed or implied.

Reviewed By: AEI
SSG MEP, Inc. Project Number: 10054.00
Date: December 17, 2012

Date Received:
December 4, 2012

Submittal Number:
238126

Project Name:
Northwestern Mutual-West Denver Office Building

Project Number:
12J2000

Client/Construction Manager:
Barker Rinker Seacat & Partners

Submitting Contractor:
GHPhipps

Description:
Split System Air Conditioners

A – No Exceptions Taken **B** – Make Correction(s) as Noted, No Resubmittal Required
C – Rejected **D** – Revise and Resubmit **E** – Submit Specified Item

ITEM (e.g. spec # or dwg #)	REFERENCE (e.g. page # or paragraph)	COMMENTS	ACTION (legend above)
238126 – Split System Air Conditioners	FCU-1/ACCU-1 Carrier	No comment.	A
238126 – Split System Air Conditioners	FCU-2 Multi-aqua/ACCU-2 Compu-Aire, Inc.	No comment.	A

GH Phipps CONSTRUCTION COMPANIES

5995 Greenwood Plaza Blvd.
Suite 100
Greenwood Village, CO 80111-4710
303-571-5377
303-629-7467 (fax)

TRANSMITTAL

No. 12J2000-0103

PROJECT: Northwestern Mutual-West Denver Office Bldg

DATE: 12/04/2012

TO: Barker Rinker Seacat & Partnrs
3457 Ringsby Ct #200
Denver CO 80216

RE: 238126-Split-System Air-Conditione

ATTN: Keith Hayes

Ph/Fax: 303-455-1366

JOB: 12J2000

WE ARE SENDING:	SUBMITTED FOR:	ACTION TAKEN:
☑ Shop Drawings	☑ Approval	☐ Approved as Submitted
☐ Letter	☐ Your Use	☐ Approved as Noted
☐ Prints	☐ As Requested	☐ Returned After Loan
☐ Change Order	☐ Review and Comment	☐ Resubmit
☐ Plans		☐ Submit
☐ Samples	**SENT VIA:**	☐ Returned
☑ Specifications / Product Data	☐ Attached	☐ Returned for Corrections
☐ Other:	☐ Separate Cover Via:	☑ Due Date: 12/11/2012

NOTES:

Item	*Package*	*Code*	*Rev.*	*Copies*	*Date*	*Description*	*Status*
Submittal	238126	238126.01	1	1	12/04/2012	Split-System Air-Conditioners- FCU-1- Fan Coil Unit- Product Data	Architect Review
Submittal	238126	238126.02	1	1	12/04/2012	Split-Split-System Air-Conditioners- FCU-1- Fan Coil Unit- Shop Drawings	Architect Review
Submittal	238126	238126.03	1	1	12/04/2012	Split-Split-System Air-Conditioners- FCU-2- Fan Coil Unit- Product Data	Architect Review
Submittal	238126	238126.04	1	1	12/04/2012	Split-Split-System Air-Conditioners- FCU-2- Fan Coil Unit- Shop Drawings	Architect Review
Submittal	238126	238126.05	1	1	12/04/2012	Split-System Air-Conditioners- ACCU-1- Air Cooled Condensing Unit- Product Data	Architect Review
Submittal	238126	238126.06	1	1	12/04/2012	Split-System Air-Conditioners- ACCU-1- Air Cooled Condensing Unit- Shop Drawings	Architect Review
Submittal	238126	238126.07	1	1	12/04/2012	Split-System Air-Conditioners- ACCU-2- Air Cooled Condensing Unit- Product Data	Architect Review
Submittal	238126	238126.08	1	1	12/04/2012	Split-System Air-Conditioners- ACCU-2-Air Cooled Condensing Unit- Shop Drawings	Architect Review

CC:

Signed: _____

Jennifer Lynn

Submittal Stamp Sheet

Project: Northwestern Mutual West Denver Office Bldg
Project Address: 825 Simms Street, Lakewood CO
Phipps' Job #: 12J2000

Barker Rinker Seacat Architecture
3457 Ringsby Court, Suite 200
Denver CO 80216

Subcontractor / Supplier	**Adams County Plumbing & Heating**
Specification Section	**238126 Split System Air Conditioners**
Submittal No.	**238126.01, 02, 05, 06: FCU/ACCU-1 Product Data & Shop Drawings**

Submitted For:	**APPROVAL**	**RESUBMITTAL**	**RECORD ONLY**

Gerald H. Phipps, Inc.: **SUBMITTED** ***GH Phipps*** ***Construction Companies*** GH Phipps has reviewed, approved, and herby submits the attached in accordance with the contract documents. Note to Subcontractor/Material Supplier: Subcontractor/Material Supplier remains responsible for the confirmation and correlation of dimensions at the jobsite; fabrication processes and construction techniques; coordination of the work with the work of other trades; and satisfactory performance of the work. **DATE: 11/30/12** **Jennifer Lynn, Project Engineer**	Architect:
Engineer:	Other:

NOTES:

Carrier West
4800 Osage Street
Denver, CO 80221
Ph: (303) 825-4328
Fax: (303) 820-2302

RE-SUBMITTAL COVER SHEET

JOB: Northwestern Mutual
LOCATION: Denver, Colorado
CONTRACTOR: Adams County Heating and Plumbing

TAG	QTY	MODEL NUMBER	DESCRIPTION
RTU-1	1	48A5T035FQV62AER	Carrier 35 Ton R410A Variable Air Volume Packaged Gas Heating / Electric Cooling Rooftop Unit 460 Volt – 3 Phase – 60 Hertz
FCU/ACCU-1	1	RAV-SP180KRT-UL RAV-SP180AT2-UL	1.5 Ton High Wall Duct Free Fan Coil with 1.5 Ton Remote Outdoor Condensing Unit 208/230 Volt – 1 Phase – 60 Hertz
FCU/ACCU-2	1	MHWX-36-H-1 MKA-212	2.5 Ton High Wall Duct Free Fan Coil with 2.5 Ton Ducted Indoor Condenser 208/230 Volt – 1 Phase – 60 Hertz
VAV	21	35ED	Carrier Pinch-Off Variable Air Volume Boxes with BACnet Controls

CARRIER WEST CERTIFIED THE ABOVE DATA TO BE A TRUE ABSTRACT OF MANUFACTURES' CURRENT RATINGS FOR THE PRODUCTS SHOWN.

DATE: **October 2, 2012**

PREPARED BY: Corey W. Trease

2669 E. Hwy 224•Denver, CO 80229•303-288-4546•FAX: 303-289-5756

SUBMITTAL

DATE: November 9, 2012

JOB NO:		12-129
PROJECT:		Northwestern Mutual West Denver Office Building
GENERAL CONTRACTOR:		GH Phipps
ARCHITECT:		Barker Rinker Seacat Architecture
MECH. ENGINEER:		Scanlon Szynskie Group
SUPPLIER:		Carrier
SUBMITTAL NO:		01
SPECIFICATION:		237413 – Packaged, Outdoor, Central-Station Air Handling Units
PARAGRAPH:		All Required Sections (RTU-1)

SUBMITTAL

☒ Performance Data
☒ Certified Dimension Print

Model: RAV-SP180KRT-UL
RAV-SP180AT2-UL

208/230 Volt – 1 Phase – 60 Hertz

Qty: 1

Tagged: FCU/ACCU-1

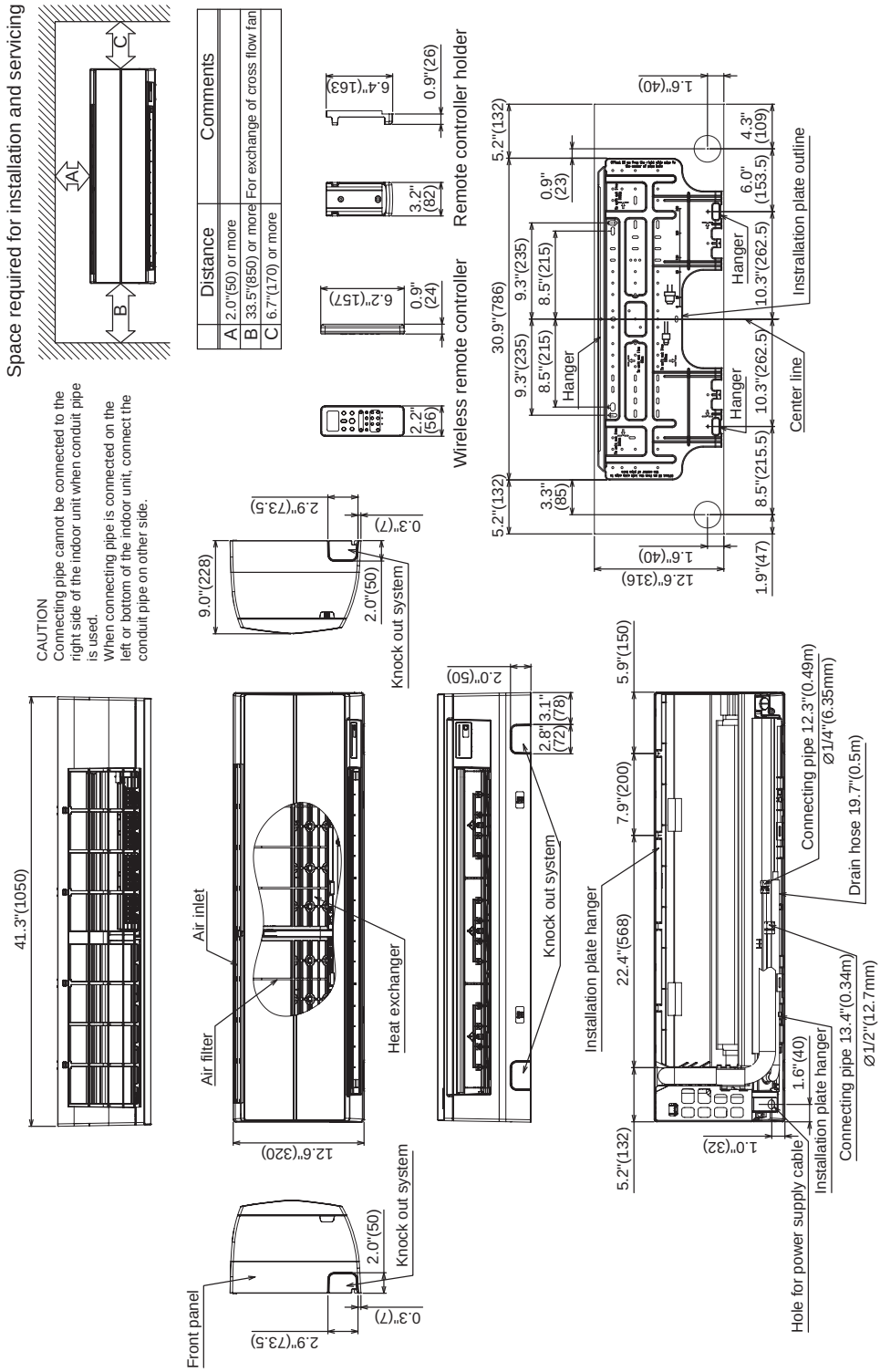
Includes: Condensate Pump, Condensing Unit Pad, Low Ambient Standard to 5 Degrees (Wind Baffle Field Fabricated)

Date: June 14, 2012

4-2. Dimension

RAV-SP180KRT-UL

Unit:in(mm)



4. HIGH WALL TYPE

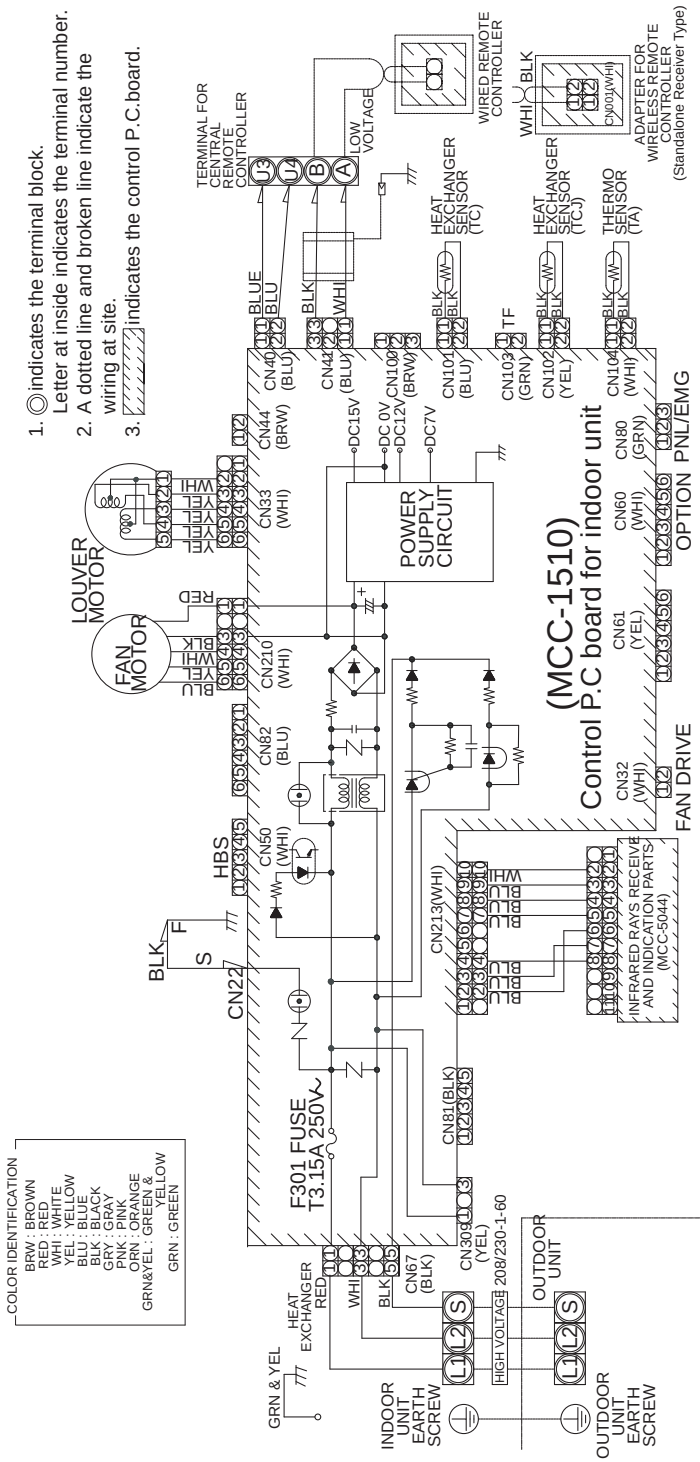
4-1. Specifications

Highwall USA

System	Size		018	024
	Outdoor Model		RAV-SP180AT2-UL	RAV-SP240AT2-UL
	Indoor Model		RAV-SP180KRT-UL	RAV-SP240KRT-UL
Performance	Cooling Rated Capacity (Btu/h)		18000	25000
	SEER		19.5	16.7
	EER		10.0	9.1
	Heating Rated Capacity (Btu/h)		19000	26400
	HSPF		11.5	9.8
Controls	Wireless (°C, °F, Convertible)		Convertible	Convertible
	Wireless Range (ft.)		23	23
	IR or RF		IR	IR
	Wired (°C, °F, Convertible)		°F	°F
Operating Range	Cooling	Outdoor Min - Max DB (°F) *1	23 to 109	23 to 109
		Indoor Min - Max DB (°F)	70 to 89	69 to 89
		Indoor Min - Max WB (°F)	59 to 75	59 to 75
	Heating	Outdoor WB Min - Max (°F)	-4 to 59	-4 to 59
		Indoor DB Min -Max (°F)	59 to 86	59 to 86
Piping	Standard Piping Length (ft.)		25	25
	Min. Piping Length (ft.)		16'5"	16'5"
	Max. Piping Length (ft.)		164'1"	164'1"
	Lift (Outdoor below Indoor) (ft.)		98'5"	98'5"
	Lift (Outdoor above Indoor) (ft.)		98'5"	98'5"
	Gas Pipe (size/connection type)		1/2"	5/8"
	Liquid Pipe (size/connection type)		1/4"	3/8"
	Additional refrigerant charge under long piping connection		0.22oz/ft (65'7" to 164'1")	0.43oz/ft (98'5" to 164'1")
	Indoor Model Piping Orientation	Left Back	Yes	Yes
		Right Back	Yes	Yes
		Left Bottom	Yes	Yes
		Right Bottom	Yes	Yes
		Left	Yes	Yes
	Outdoor Model Piping Orientation	Side	Yes	Yes
		Back	No	Yes
		Bottom	No	Yes
	Drain Pump Lift (in.)		–	–
Electrical	Voltage		208/230-1-60	208/230-1-60
	Indoor Unit Connected from Outdoor (Yes/No)		Yes	Yes
	Number Of Conductors Between Indoor and Outdoor Units		4	4
	Type of Wire (Shielded - yes or no)			
	Cooling Power Consumption (W)		1800	2747
	Heating Power Consumption		1710	2780
	Cooling Running Current (A)		7.96	12.20
	Heating Running Current (A)		7.53	12.52
	Maximum Current Amps (A)		17	24
	Maximum Over Protection Device Amps (A)*2		30	40
	Breaker (A)		20	25
Outdoor	Dimensions	Height (in.)	21.7	35.0
		Width (in.)	30.7	35.4
		Length (in.)	11.4	12.6
	Weight -Net/Gross (lbs.)		98/105	144.5/157
	Refrigerant charged (lbs.)		3.1	4.6
	Variable Speed Outdoor Motor (Yes/No)		Yes	Yes
	Appearance		Silky shade (Muncel 1Y8.5/0.5)	Silky shade (Muncel 1Y8.5/0.5)
	Sound Pressure (dB (A))		48/49	49/50
Compressor	Type		Hermetic compressor	Hermetic compressor
	Motor		1.1	2.0
Indoor	Dimensions	Width (in.)	9	9
		Height (in.)	12.6	12.6
		Length (in.)	41.3	41.3
	Weight -Net/Gross (lbs.)		31/36	31/36
	Appearance		Moon White (2.5GY9.0/0.5)	Moon White (2.5GY9.0/0.5)
	Sound Pressure at Different Speeds (dB (A))		43/41/38	46/41/38
	Air flow DRY (CFM) (H/M/L)		490/430/400	560/460/410

* 1 When installed a duct or wind shield so that it is not affected by the wind. The minimum outside temperature will be 5°F
* 2 UL value

4-3. Wiring Diagram

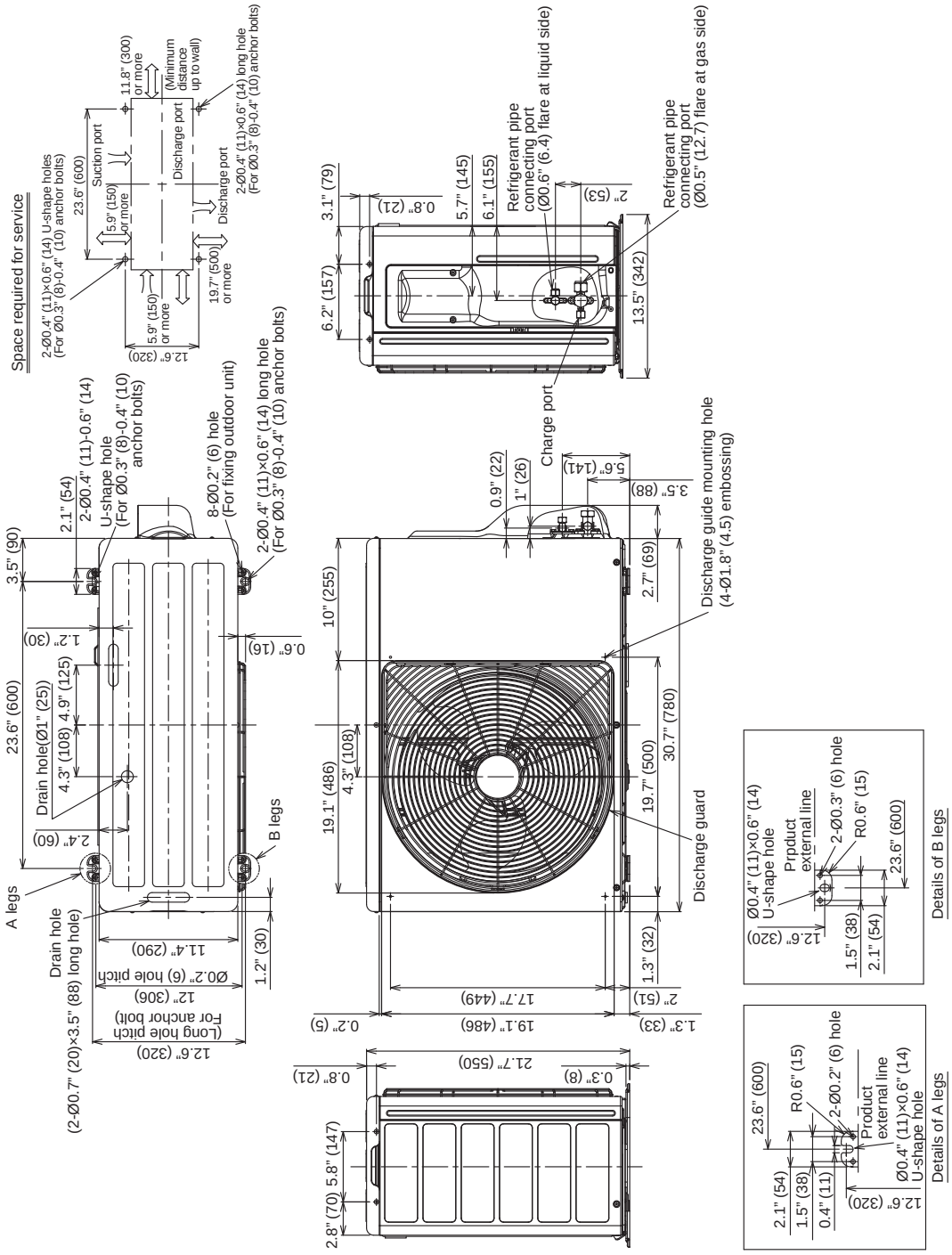


5. OUTDOOR UNIT

5-1. Dimension

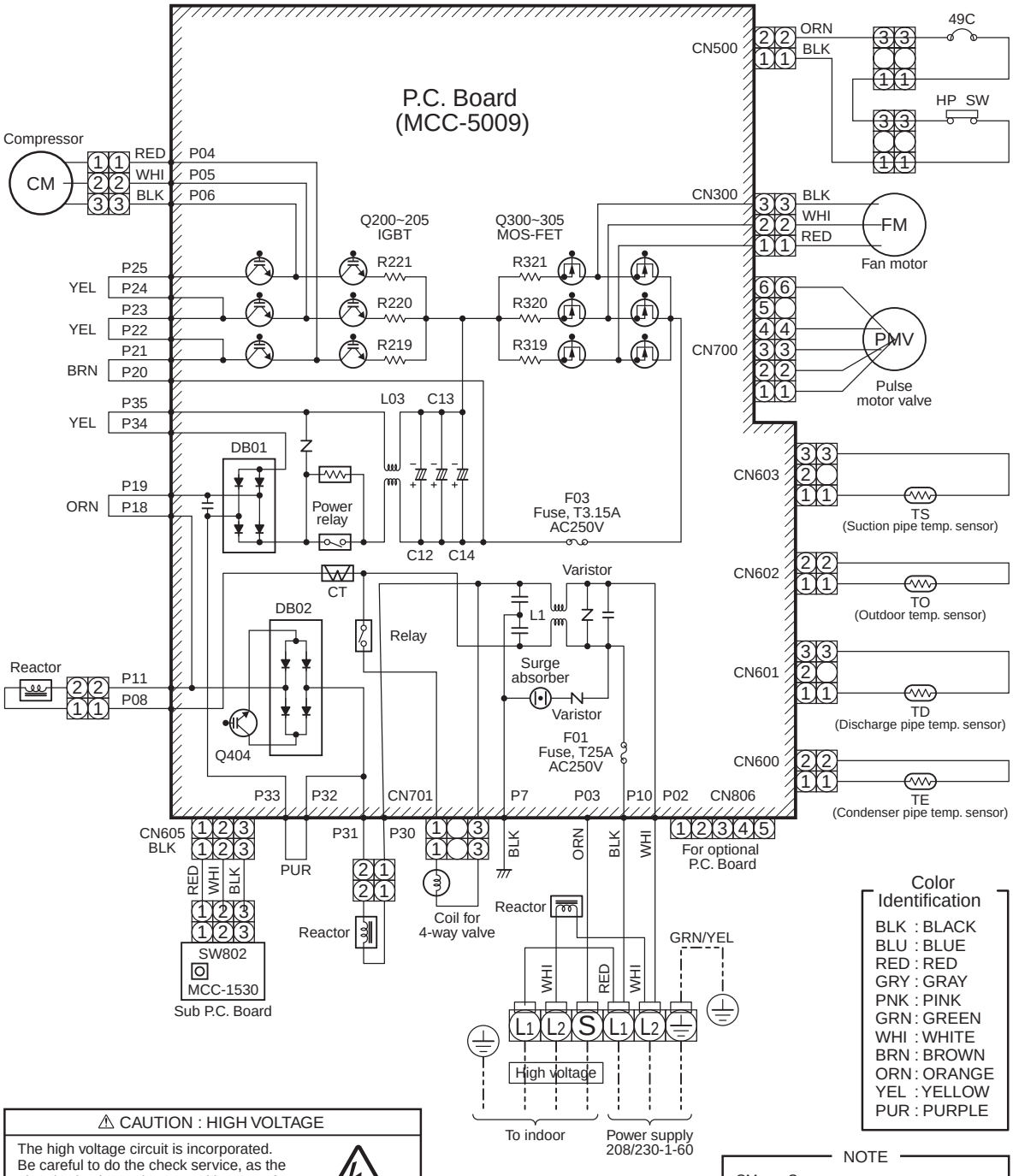
RAV-SP180AT2-UL

Unit:in(mm)



5-2. Wiring Diagram

RAV-SP180AT2-UL



Color Identification	
BLK	BLACK
BLU	BLUE
RED	RED
GRY	GRAY
PNK	PINK
GRN	GREEN
WHI	WHITE
BRN	BROWN
ORN	ORANGE
YEL	YELLOW
PUR	PURPLE

⚠ CAUTION : HIGH VOLTAGE

The high voltage circuit is incorporated.
Be careful to do the check service, as the electric shock may be caused in case of touching parts on the P.C. board by hand.

The 4-way valve coil is turned on while the cooling operation

1. ◯ indicates the terminal block.
   Alphanumeric characters in the cycle indicate the terminal No.
2. The two-dot chain line indicates the wiring procured locally.
3. ▨ indicates the P.C. board.
4. For the indoor unit circuit, refer to the wiring diagram of the indoor unit.

NOTE

CM	:	Compressor
PMV	:	Pulse Motor Valve
FM	:	Fan Motor
TE	:	Heat Exchanger Temp. Sensor
TD	:	Discharge Temp. Sensor
TO	:	Outdoor Temp. Sensor
TS	:	Suction Temp. Sensor
IGBT	:	Insulated Gate Bipolar Transistor
DB	:	Rectifier
CT	:	Curreut Transformer
49C	:	Compressor Case Thermostat
HP SW	:	High pressure switch

Submittal Stamp Sheet

Project: Northwestern Mutual West Denver Office Bldg
Project Address: 825 Simms Street, Lakewood CO
Phipps' Job #: 12J2000

Barker Rinker Seacat Architecture
3457 Ringsby Court, Suite 200
Denver CO 80216

Subcontractor / Supplier	**Adams County Plumbing & Heating**
Specification Section	**238126 Split System Air Conditioners**
Submittal No.	**238126.03, 04, 07, 08: FCU/ACCU-2 Product Data & Shop Drawings**

Submitted For:	**APPROVAL**	**RESUBMITTAL**	**RECORD ONLY**

Gerald H. Phipps, Inc.: **SUBMITTED** ***GH Phipps*** ***Construction Companies*** GH Phipps has reviewed, approved, and herby submits the attached in accordance with the contract documents. Note to Subcontractor/Material Supplier: Subcontractor/Material Supplier remains responsible for the confirmation and correlation of dimensions at the jobsite; fabrication processes and construction techniques; coordination of the work with the work of other trades; and satisfactory performance of the work. **DATE: 11/30/12** **Jennifer Lynn, Project Engineer**	Architect:
Engineer:	Other:

NOTES:

Carrier West
4800 Osage Street
Denver, CO 80221
Ph: (303) 825-4328
Fax: (303) 820-2302

RE-SUBMITTAL COVER SHEET

JOB: Northwestern Mutual
LOCATION: Denver, Colorado
CONTRACTOR: Adams County Heating and Plumbing

TAG	QTY	MODEL NUMBER	DESCRIPTION
RTU-1	1	48A5T035FQV62AER	Carrier 35 Ton R410A Variable Air Volume Packaged Gas Heating / Electric Cooling Rooftop Unit 460 Volt – 3 Phase – 60 Hertz
FCU/ACCU-1	1	RAV-SP180KRT-UL RAV-SP180AT2-UL	1.5 Ton High Wall Duct Free Fan Coil with 1.5 Ton Remote Outdoor Condensing Unit 208/230 Volt – 1 Phase – 60 Hertz
FCU/ACCU-2	1	MHWX-36-H-1 MKA-212	2.5 Ton High Wall Duct Free Fan Coil with 2.5 Ton Ducted Indoor Condenser 208/230 Volt – 1 Phase – 60 Hertz
VAV	21	35ED	Carrier Pinch-Off Variable Air Volume Boxes with BACnet Controls

CARRIER WEST CERTIFIED THE ABOVE DATA TO BE A TRUE ABSTRACT OF MANUFACTURES' CURRENT RATINGS FOR THE PRODUCTS SHOWN.

DATE: **October 2, 2012**

PREPARED BY: Corey W. Trease

2669 E. Hwy 224•Denver, CO 80229•303-288-4546•FAX: 303-289-5756

SUBMITTAL

DATE: November 9, 2012

JOB NO:		12-129
PROJECT:		Northwestern Mutual West Denver Office Building
GENERAL CONTRACTOR:		GH Phipps
ARCHITECT:		Barker Rinker Seacat Architecture
MECH. ENGINEER:		Scanlon Szynskie Group
SUPPLIER:		Carrier
SUBMITTAL NO:		01
SPECIFICATION:		237413 – Packaged, Outdoor, Central-Station Air Handling Units
PARAGRAPH:		All Required Sections (RTU-1)

SUBMITTAL

☒ Performance Data
☒ Certified Dimension Print

Model: MHWX-36-H-1 / MKA-212

208/230 Volt – 1 Phase – 60 Hertz

Qty: 1

Tagged: FCU/ACCU-2

Includes: Low Ambient and Refrigeration Specialties

Date: June 14, 2012

Multi aqua™

MHWX Direct Expansion

Hi-Wall Fan Coil

Direct Expansion Fan Coil 9,000 - 36,000 BTUH

HVAC Guide Specifications

Direct Expansion Hi-Wall Fan Coil

Nominal Size:

9,000 – 36,000 BTUH

Multiaqua Model Number:

MHWX-09
MHWX-12
MHWX-18
MHWX-24
MHWX-36

Part 1-General

1.01 System Description

Multiaqua Direct Expansion Fan Coils are manufactured with high impact molded polymers.

1.02 Quality Assurance

A. Certified in accordance with U.L. Standard 95, latest version (U.S.A.)
B. Manufactured in a facility registered to ISO 9002, Manufacturing Quality Standard.
C. Fully load tested at the factory.
D. Damage resistant packaging.

1.03 Delivery, Storage and Handling

A. Packaged and readied for shipment from the factory.
B. Controls shall be capable of withstanding 150°F storage temperatures in the control compartment.
C. Stored and handled per manufacturer's recommendations.

Part 2-Product

2.01 Equipment

A. General:
   1. Unit shall be a factory assembled direct expansion fan coil.
   2. Shall be assembled with high quality.
   3. Contained with the unit shall be all factory wiring, piping, associated controls and special accessories required prior to start up.

B. Unit Cabinet:
   1. Composed of high impact polymers.
   2. Shall be internally insulated to insure quiet operation.

C. Fan Motors:
   1. Shall be available in 208/230-1-50/60 vac.
   1. Fan motors shall be three speed, direct drive, and PSC type.
   2. Totally enclosed.
   3. Internal overload protected.
   4. Unit shall contain a swing motor to modulate the discharge air.

D. Blower Wheels:
   1. Blower wheels are tangential and dynamically balanced.

E. DX Coil:
   1. Coils manufactured with 3/8" rifled copper tubing mechanically bonded to aluminum fins.
   2. Coils shall be factory tested to 350 psig.

F. Drain Pan:
   1. All drain pans shall be molded with high impact polymers.
   2. The exterior of all drain pans shall be insulated with closed cell to prevent condensation.
   3. Pans shall contain a flexible drain tubing that is accessible from the back of the unit.

G. Filters:
    1. Unit shall contain 65% washable filters.

Part 3-Controls and Safeties
3.01 Controls
A. Fan coils shall be completely factory wired and tested.
B. Shall be capable of heat pump operation.
C. Controls shall include a circuit board, room sensor, indoor coil thermistor, transformer and wireless remote.
D. Controls shall be capable of incorporating an optional hard-wired thermostat.

3.02 Safeties:
A. Fan coil shall contain a non reusable fuse on the secondary voltage side of the transformer.
B. Discharge air sensor.

Part 4-Operating Characteristics:
4.01 Electrical Requirements
A. Unit shall incorporate a three prong male primary electrical power cord.
B. Electrical power supply shall be rated to withstand 120°F operating ambient temperatures.

MHWX Product Specifications & Capacity

Physical Data									
Model Number	Height (in)	Width (in)	Depth (in)	Weight (lbs)	Coil Rows FPI	Copper Diameter (in)	Liquid Line (in)	Suction Line (in)	Drain (in)
MHWX-09	11.70	34.60	7.10	20.00	2-20	3/8	1/4	3/8	1/2
MHWX-12	12.00	39.00	7.10	22.00	2-14	3/8	1/4	3/8	1/2
MHWX-18	14.20	46.10	8.10	35.60	2-16	3/8	5/16	1/2	3/4
MHWX-24	14.20	46.10	8.10	37.40	3-17	3/8	3/8	5/8	3/4
MHWX-36	14.40	57.10	8.50	54.00	3-18	3/8	3/8	5/8	3/4

Electrical Data						
Model Number	Hi Speed CFM	Volts/ Phase/ Hertz	Motor HP	Full Load Ampacity	Fuse or HACR Circuit Breaker Per Circuit	
					Minimum Amps	Maximum Amps
MHWX-09-C-01	270	208/230-1-50/60	1/50	0.07	.09	1
MHWX-12-C-01	330		1/50	0.07	.09	1
MHWX-18-C-01	480		1/20	0.15	.19	1
MHWX-24-C-01	600		1/20	0.15	.19	1
MHWX-36-C-01	850		1/12	0.26	.33	1

Performance Data		
Model Number	CFM	Nominal Cooling Capacity
MHWX-09-C-1	270	9,000
MHWX-12-C-1	330	12,000
MHWX-18-C-1	480	18,000
MHWX-24-C-1	600	24,000
MHWX-36-C-1	850	36,000

These specifications are subject to change without notice.

INSTALLATION and OPERATION MANUAL

MHWX

Multi aqua™

INSTALLATION & OPERATING MANUAL

MHWX Hi-Wall Fan Coils
9,000-36,000 BTUH

---------- CAUTION ----------

Care must be taken when handling sheet metal. Sheet metal parts have sharp edges and could cause injury.

GENERAL

Read the entire contents of this manual before beginning installation. Multiaqua assumes no responsibility for equipment installed contradictory to any code requirement or installation instructions.

The components of this fan coil have been inspected at the factory and readied for shipment. Upon receiving the shipment a visual inspection of the packaging must be performed.

If any damage to the packaging is discovered, an inspection of the components must be performed and noted on the delivery documents. If component damage is found a damage claim must be filed by the receiving party against the delivery party immediately.

This product is designed and manufactured to permit installation in accordance with national codes. It is the installer's responsibility to install the product in accordance with national codes and/or prevailing local codes and regulations.

Care must be taken to ensure the structural integrity of the supporting members, clearances and provisions for servicing, power supply, coil connections and/or condensate removal. Before the installation ensure the structural strength of the supporting members is sufficient. See figure 1 for hanging weights of the fan coils.

This unit is designed to be installed in a horizontal configuration only. See figure 2 for fan coil and mounting plate dimensions.

FAN COIL MODEL NUMBER	APPROXIMATED WEIGHTS (lbs)
MHWX-09-C-1	20.00
MHWX-12-C-1	22.00
MHWX-18-C-1	35.60
MHWX-24-C-1	37.40
MHWX-36-C-1	54.00

Figure 1

INSTALLATION & OPERATING MANUAL

MHWX Hi-Wall Fan Coils
9,000-36,000 BTUH

FAN COIL AND MOUNTING PLATE DIMENSIONS (in)												
Fan Coil Model Number	A	B	C	D	E	F	G	H	I	J	K Field Supplied Hole	L Field Supplied Hole
MHWX-09	34.6	11.7	7.5	7.5	3.5	2.7	1.6	0.8	1.8	0.8	2.8	2.8
MHWX-12	39.0	12.0	7.5	7.5	3.6	2.7	1.5	1.1	1.7	1.0	2.8	2.8
MHWX-18	46.0	14.2	3.8	3.8	6.1	2.4	2.4	1.7	2.4	1.8	2.8	2.8
MHWX-24	46.0	14.2	3.8	3.8	6.1	2.4	2.4	1.7	2.4	1.8	2.8	2.8
MHWX-36	57.1	14.4	4.0	4.0	6.1	2.8	1.5	1.7	1.5	1.8	2.8	2.8

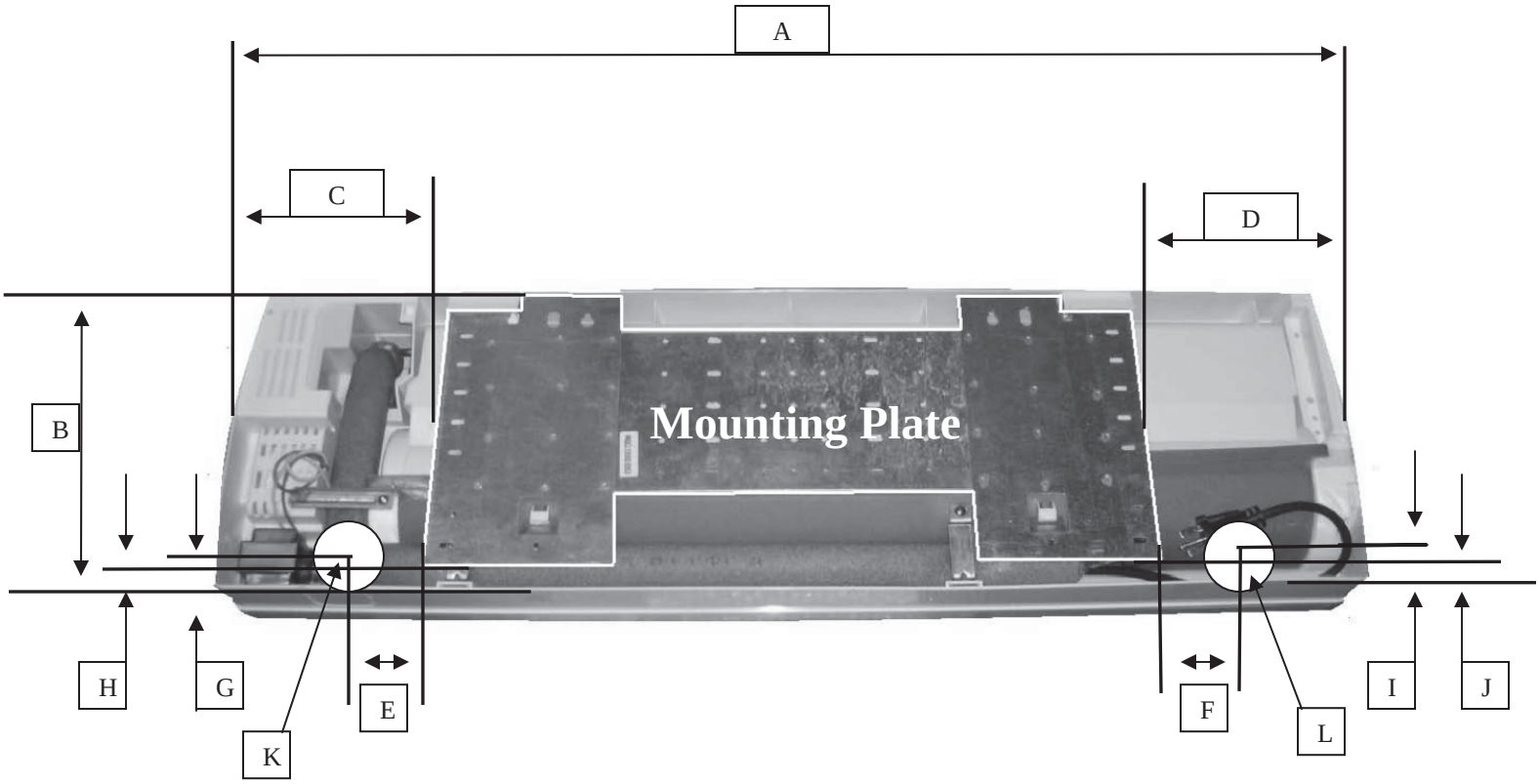


Figure 2

-------- CAUTION -------
Care must be taken when handling sheet metal. Sheet metal parts have sharp edges and could cause injury.

INSTRUCTIONS FOR INSTALLING THE MOUNTING PLATE

1. After a suitable place for installation has been selected, place the mounting plate horizontally on the wall. Make sure the alignment is horizontal. Use a plumb line if available. Mark on the wall where the mounting holes will be drilled.

Figure 3

2. Drill the holes for the type of mounting hardware to be used. Check local building codes for correct mounting hardware. Secure the mounting plate and check for stiffness.

3 Drill a diagonal piping access hole (2 .75") in diameter on both sides of the mounting bracket. Refer to figure 2 for field supplied hole locations

Figure 4

4. Check local and national codes for piping access wall penetrations. See figure 5 if wall sleeves are required.

Figure 5

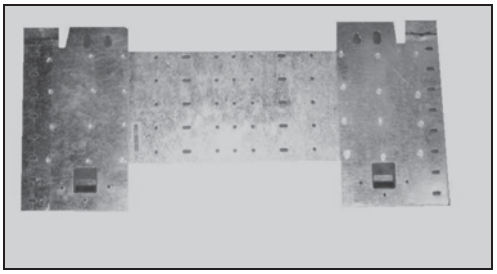


Figure 3

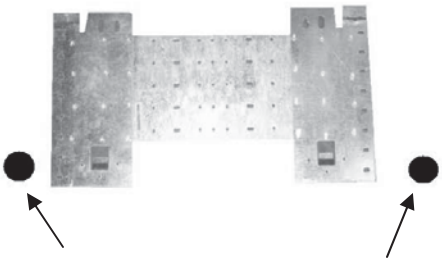


Figure 4

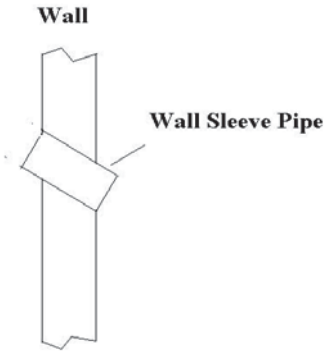


Figure 5

INSTRUCTIONS FOR INSTALLING FAN COIL UNIT ONTO MOUNTING PLATE

1. Route the fan coil piping, electrical, condenser control wires and/or flexible drain hose through either of the 2.75” previously drilled holes in step 3 figure 4. Ensure that the piping is insulated per local and national codes. Improper insulation could result in voided warranty and/or building damage.

Figure 6

2. There is a piping channel in the bottom portion of the back of the units for crossover piping, drain, condenser control wires and/or electrical.

Figure 7

3. The TXV can be installed at the unit or condenser. Ensure that the liquid is insulated completely if the TXV is installed at the condenser.

4. Figure 8 depicts (from the back of the unit) the 24 vac condenser control wires on the left and the 220 vac power cord on the right. These can be routed to either the right or left hand side of the fan coil.

Figure 8

Figure 6

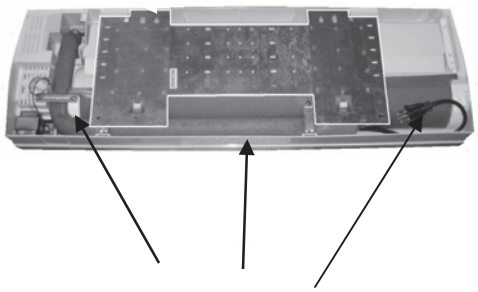


Figure 7

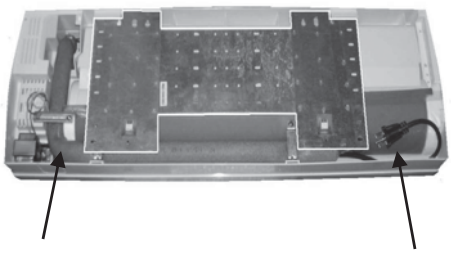


Figure 8

INSTRUCTIONS FOR INSTALLING FAN COIL UNIT ONTO MOUNTING PLATE

4. Ensure that the drain tubing is installed with at least 1/4” per foot of downward slope.

5. Secure the fan coil to the mounting plate by first sliding the fan coil onto the two notches provided on the mounting plate.
Figure 9 & 10

6. Push the bottom of the fan coil towards the wall in order to engage the locking clips.
Figure 11

7. Connect the refrigerant lines and pressure test lines to make sure there are no leaks.

8. Connect the condensate drain hose. Make certain that the drain has no traps or dips in the line that would impede drainage.

9. Carefully seal any wall penetrations per local and national codes.

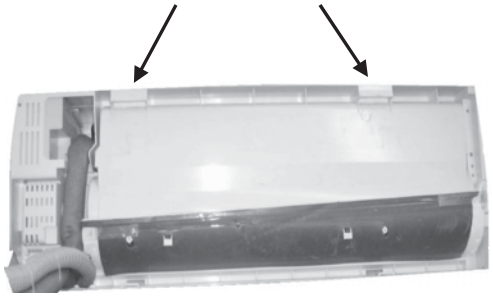


Figure 9

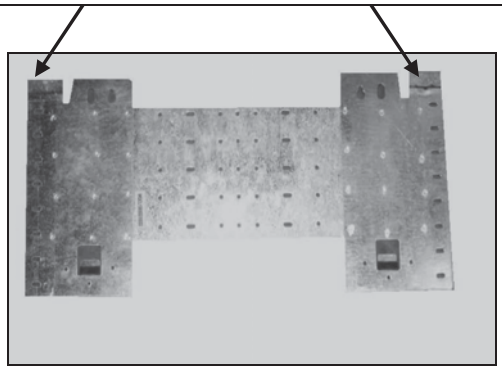


Figure 10

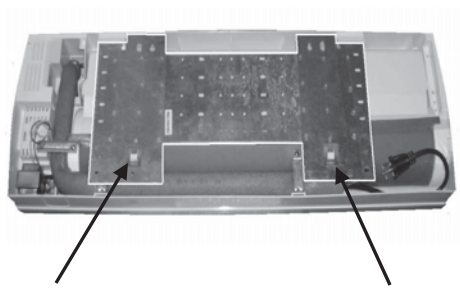


Figure 11

MHWX CONTROLS OPERATION GUIDE

Wireless Control: Standard Control Package (Page 355)

Optional Wired Control: EG-003 (Page 361)

MHWX CONTROLS OPERATION GUIDE

Wireless Control:

Name and function of remote controller

Note:

- Be sure there are no obstructions between receiver and remote controller.
- The remote control signal can be received at the distance of up to about 21 feet.
- Do not throw or drop the remote controller.
- Do not put any liquid in the remote controller and do not put it in direct sunlight or any place where it is very hot.
- Remove batteries when the remote controller is not in use for extended periods of time.
- The remote controller should be placed 3 or more feet away from any electric appliance.

LED MODE INDICATOR FOR REMOTE CONTROLLER:

INDICATOR LIGHTS	REMOTE SETTING	FUNCTION
RED-GREEN	COOL	COOLING OPERATION ONLY
RED-OFF	DRY	HUMIDITY CONTROL,NO FAN
RED-RED	HEAT	HEATING OPERATION ONLY
RED-OFF	FAN	FAN OPERATION ONLY
RED-BLINKING	AUTO	AUTO SELECTION BETWEEN HEAT & COOL DEPENDENT ON ROOM TEMP & SET TEMP
RED-ORANGE	ALERT	FAN COIL WAITING FOR LAT TO REACH PROPER TEMPERATURE NECESSARY TO SATISFY SET POINT

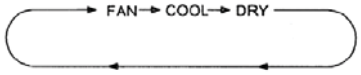
MHWX CONTROLS OPERATION GUIDE

FUNCTION

1. **TRANSMISSION SOURCE**
   - Infra red transmission source

2. **POWER**
   - Press to turn the fan coil on and off or vice versa.
   (Red LED left will light to indicate the control is on)

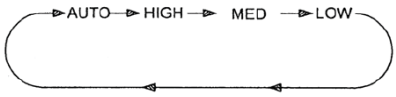
3. **MODE**
   - To select desired operation mode.
   It will switch from one to another as shown.
   COOL - Cooling operation.
   DRY - Humidity control.
   HEAT - Heating operation.
   FAN - Fan only. No cooling or heating capability.
   AUTO - Operation mode will be selected automatically between HEAT and COOL mode, depending upon the room temperature and SET temperature.



Mode selection sequence (COOL)

Mode selection sequence (HEAT/COOL)

4. **FAN**
   - To select fan speed. It will switch from one to another as shown below.
   - When the system temperature sensor is not calling for cool or heat the fan will run at the speed previously entered in fan mode selection (high, medium or low).
   - If auto was the previously entered fan speed in cooling: The fan will run at low speed until the temperature sensor calls for either heating or cooling at which point the fan will return to auto speed control



Fan Speed Sequence

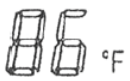
MHWX CONTROLS OPERATION GUIDE

FUNCTION

5. TEMPERATURE SETTING

- Press "▲" to increase set temperature.
- Press "▼" to decrease set temperature.
- Press "▲" and "▼" Simultaneously to toggle between °C and °F display mode.
- Temperature range: 16 C to 30°C in °C display mode and 60°F to 86°F in °F display mode.

(a) °C display mode



(b) °F display mode

6. **DELAY TIMER SETTING**

- The delay timer is capable of delaying both on and off functions. The delay feature will take affect in all modes with the exception of the sleep mode. Each time the "▲" and "▼" is pressed it increases or decreases the On or OFF set point by 1 hour; up to a maximum of 18 hours.

To set the OFF DELAY:

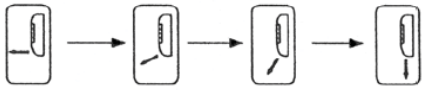
With the system in operation, enter the system OFF time by pressing the "▲" button to the desired number of hours ahead that the system will be allowed to run. When the number of hours entered has elapsed the system will turn off.

To set the ON DELAY:

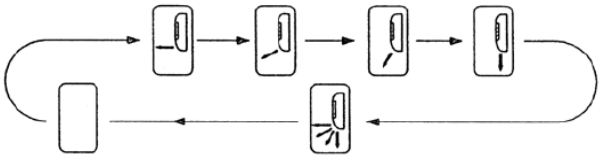
- Set the on delay by entering the desired mode of operation (fan, heat, cool and the appropriate temperature. This will be the settings the system will follow when operation resumes. After setting the mode and any applicable temperature with the control, turn the remote off. Now enter the number of hours to elapse before operation resumes by pressing the "▲" button on the remote to the desired number. When the time (in hours) entered has elapsed the system will resume operation according to the pre-set mode and temperature.

MHWX CONTROLS OPERATION GUIDE

7. **CANCEL**
   - To cancel any setting on the delay timer.
8. **LOUVER**
   - Two different functions are available:
   1. To set the louver stop position. There are 4 angles available. The sequence is as follows.



   2. To set the louver swing (continuous motion). The sequence is as follows.



9. **SLEEP**
   - This function when selected will allow the user to determine a “sleep” period. In cooling the selected temperature will rise to 1° above set point in 1/2 hour, rising to 2° in 1 hour, rising again to 4° after 2 hours of the SLEEP CYCLE.

SLEEP FUNCTION DISPLAY

10. **DRY**
    - This function operates to control humidity within a conditioned space. It measures the difference between set point and the actual room temperature. An algorithm determines how far above set point the actual room temperature is to set point temperature and selects periods of condenser operation and low fan operation. The greater the difference between room temperature and set point temperature prompts greater run time with less temperature. With less temperature differences, periods of fan and condenser operation are called for in varying increments as determined by the difference. In this mode (low speed) fan operation will start 30 seconds after condenser has started and stops 30 seconds after condenser has stopped.

MHWX CONTROLS OPERATION GUIDE

11. **AUTO**
- This function will automatically control the system switching between heating and cooling operation. If the present auto mode is cooling, a switch to heating operation will begin only if the actual room temperature is 7° below selected control set point. If the present auto mode is heating, a switch to cooling operation will begin only when the room temperature is 3° above selected control set point.

12. **TRANSMISSION INDICATOR**
- Blinks twice to indicate that transmission has taken place between remote and receiver.
- Beeps indicate fan coil acknowledging receipt of transmission.

TRANSMISSION INDICATOR

13. **HOW TO INSERT BATTERIES**
1. Remove the battery cover from the back of the remote
2. Insert the (2) AAA batteries. Ensure that the polarity of the batteries is as shown inside of the battery compartment.
3. Re-attach the battery compartment cover.

MHWX CONTROLS OPERATION GUIDE

Optional Wired Control: EG-003

LED MODE INDICATOR FOR REMOTE CONTROLLER:

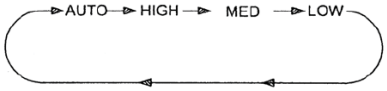
INDICATOR LIGHTS	SETTING	FUNCTION
RED-GREEN	COOL	COOLING OPERATION ONLY
RED-RED	HEAT	HEATING OPERATION ONLY
RED-BLINKING	AUTO	AUTO SELECTION BETWEEN HEAT & COOL
RED-OFF	FAN	FAN OPERATION ONLY

1. **POWER**
   - Press to turn the fan coil on and off or vice versa.
2. **MODE**
   - To select desired operation mode.
   It will switch from one to another as shown.
   COOL - Cooling operation.
   HEAT - Heating operation.
   FAN - Fan only. No cooling or heating capability.
   AUTO - Operation mode will be selected automatically between HEAT and COOL mode, depending upon the room temperature and SET temperature.

Mode selection sequence (COOL)

Mode selection sequence (HEAT/COOL)

3. **FAN**
   - - To select fan speed. It will switch from one to another as shown below.
   - When the system temperature sensor is not calling for cool or heat the fan will run at the speed previously entered in fan mode selection (high, medium or low).
   - If auto was the previously entered fan speed in cooling: The fan will run at low speed until the temperature sensor calls for either heating or cooling at which point the fan will return to auto speed control



Fan Speed Sequence

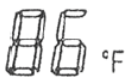
MHWX CONTROLS OPERATION GUIDE

FUNCTION

4. TEMPERATURE SETTING

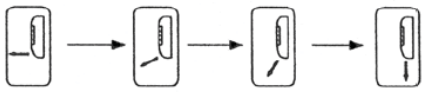
- Press "▲" to increase set temperature.
- Press "▼" to decrease set temperature.
- Press "▲" and "▼" Simultaneously to toggle between °C and °F display mode.
- Temperature range: 16 C to 30°C in °C display mode and 60°F to 86°F in °F display mode.

(a) °C display mode

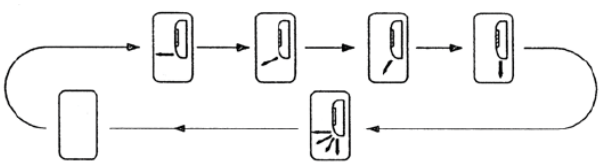


(b) °F display mode

5. **CANCEL**
   - To cancel any setting on the delay timer.
6. **LOUVER**
   - Two different functions are available:
     1. To set the louver stop position. There are 4 angles available. The sequence is as follows.



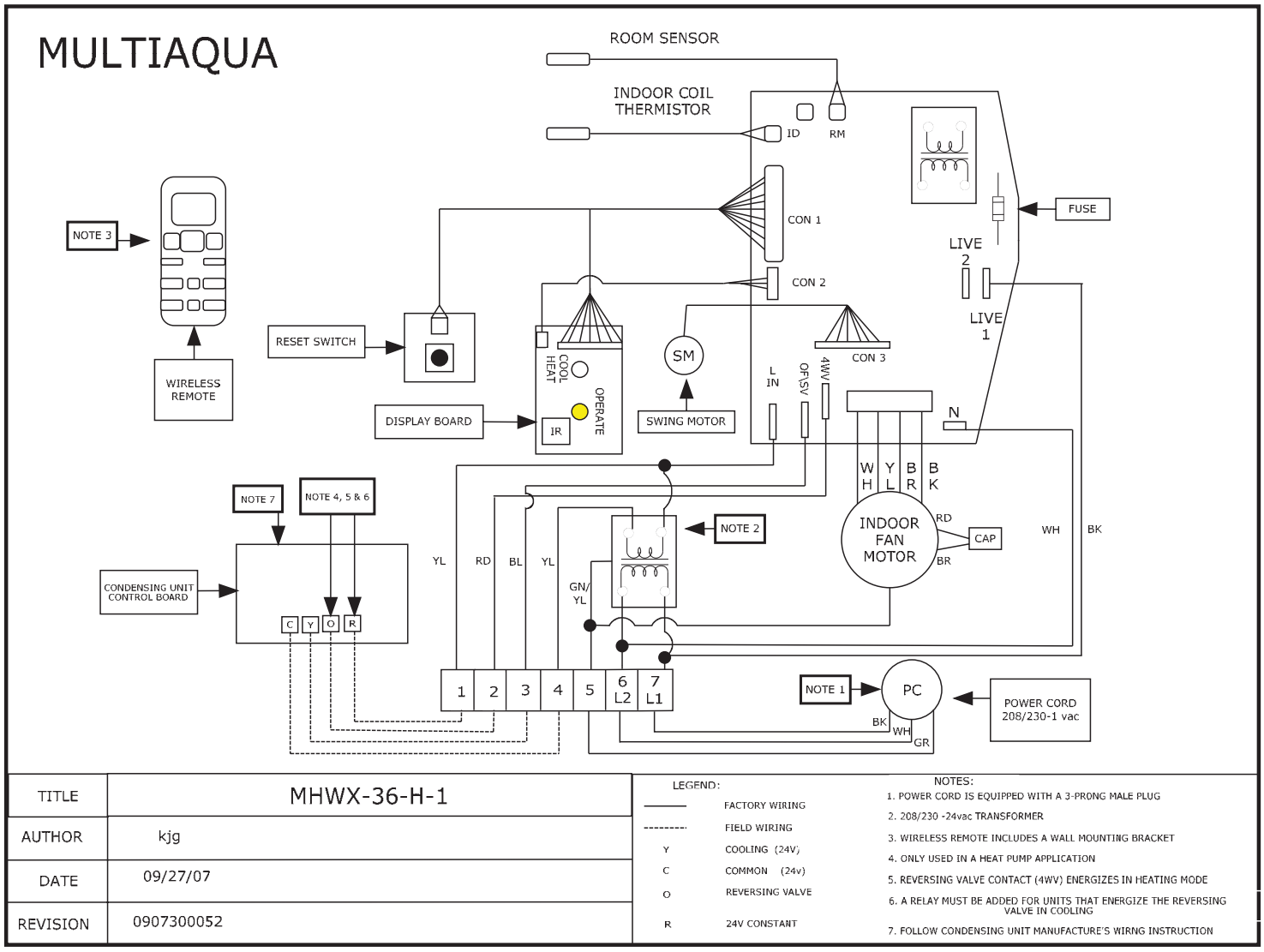
2. To set the louver swing (continuous motion). The sequence is as follows.



7. **AUTO**
   - This function will automatically control the system switching between heating and cooling operation. If the present auto mode is cooling, a switch to heating operation will begin only if the actual room temperature is 7° below selected control set point. If the present auto mode is heating, a switch to cooling operation will begin only when the room temperature is 3° above selected control set point.

MHWX-36-H-1 Wiring Diagram

208/230-1-50/60



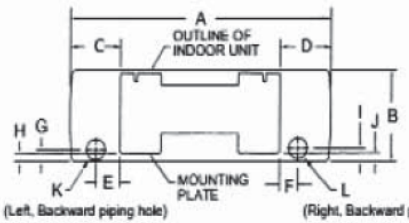
TITLE	MHWX-36-H-1
AUTHOR	kjg
DATE	09/27/07
REVISION	0907300052

LEGEND:

———	FACTORY WIRING
- - - - -	FIELD WIRING
Y	COOLING (24V)
C	COMMON (24v)
O	REVERSING VALVE
R	24V CONSTANT

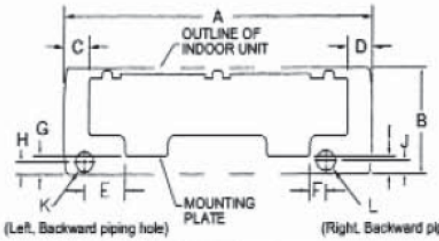
NOTES:

1. POWER CORD IS EQUIPPED WITH A 3-PRONG MALE PLUG
2. 208/230 -24vac TRANSFORMER
3. WIRELESS REMOTE INCLUDES A WALL MOUNTING BRACKET
4. ONLY USED IN A HEAT PUMP APPLICATION
5. REVERSING VALVE CONTACT (4WV) ENERGIZES IN HEATING MODE
6. A RELAY MUST BE ADDED FOR UNITS THAT ENERGIZE THE REVERSING VALVE IN CODLING
7. FOLLOW CONDENSING UNIT MANUFACTURE'S WIRNG INSTRUCTION



MODEL	A	B	C	D	E	F	G	H	I	J	K	L
MHWW-09-H1	34.6	11.7	7.5	7.5	3.5	2.7	1.6	0.8	1.8	0.8	ϕ 2.76	ϕ 2.76
MHWW-12-H1	39.0	12.0	7.5	7.5	3.6	2.7	1.5	1.1	1.7	1.0	ϕ 2.76	ϕ 2.76

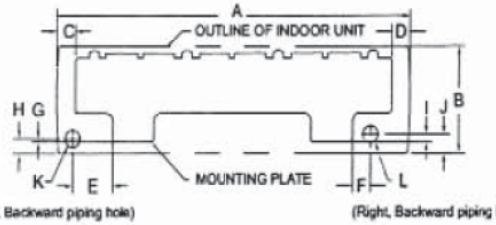
Dimensions are in inches.



MODEL	A	B	C	D	E	F	G	H	I	J	K	L
MHWW-18-H1	46.0	14.2	3.8	3.8	6.1	2.4	2.4	1.7	2.4	1.8	ϕ 2.76	ϕ 2.76
MHWW-24-H1												

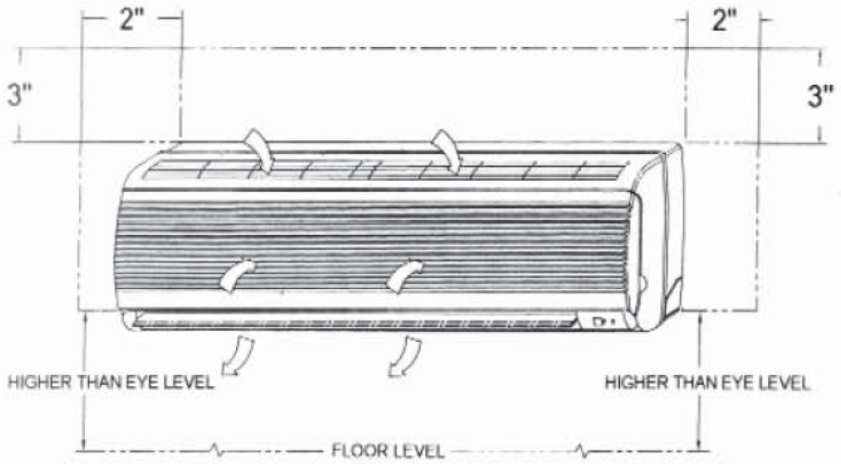
Dimensions are in inches.

MHWX Certified Drawing
Drawing # 0907400081



MODEL	A	B	C	D	E	F	G	H	I	J	K	L
MHWW-36-H1	57.1	14.4	4.0	4.0	6.1	2.8	1.5	1.7	1.5	1.8	ϕ 2.76	ϕ 2.76

Dimensions are in inches.



Dimensions are in inches.

SUBMITTAL DATA
MAXI KOOL-AIR COOLED CONDENSING UNIT

COMPU-AIRE REFERENCE: PA-5655-2
EQUIPMENT MODEL: MKA-312 (C)

DESCRIPTION: MAXI KOOL, Air Cooled Condensing DX Unit, Nominal 2 Ton, 2080V/1Ph/60 Hz with Control Panel wired to terminal block, Full control, programming and sequencing of unit shall be by others. The Unit shall consist of Condenser Coil, High Efficiency Scroll Compressor(s), and Condenser Blower-Motor Assembly.

1.0 GENERAL: The partial environmental control system shall be COMPU-AIRE condensing unit only, factory assembled, internally wired, piped, factory run tested, and field supplied and charged with R-407C by others. Unit shall have Horizontal condenser air intake and discharge. The unit shall be factory furnished with a Control Panel wired to terminal block, full control, programming and sequencing of unit shall be by others. The unit coil shall have a heat rejection capacity as shown in the technical data sheet.

Electrical input to the unit shall be 208 Volts, 1 Phase, 60 Hz.

MAXI KOOL–AIR CONDENSING UNIT shall have following components:

- Condenser Coil
- Condenser Blower and Motor
- Scroll Compressor(s)
- Low Ambient Control
- Electrical Control Panel
- Control Panel wired to terminal block (full control, programming and sequencing of unit shall be by others)

2.0 CABINET: The Air Cooled Condenser shall consist of Casing, Condenser Coil, Direct-drive Propeller Fan(s) driven by individual Fan Motor(s), Fan Guard and Mounting Legs. All fan motors shall be factory wired to a common electrical control box. The Air Cooled Condenser shall be arranged for Vertical Air Flow. The Condenser will have Dual Circuiting. Unit shall be unpainted.

3.0 CONDENSER COIL: The condenser coil shall have aluminum fins bonded to copper tubes and shall have full collars that completely cover the copper tubes. The coil shall also be designed for counter flow application for high heat transfer efficiency. Headers and connections shall be copper and shall be factory split to provide an independent condenser circuit for each compressor. The coil shall be pressure tested, sealed and pressurized for shipment.

3.1 CONDENSATE DRAIN PAN: The Condensate Drain Pan shall be of Stainless Steel construction with nonferrous connections. The exterior of the pan shall be treated with thermal mastic to avoid condensation.

4.0 BLOWER(s): The evaporator and condensing sections shall be configured for draw-thru air pattern to provide uniform Air Flow over the entire face area of the coil. Both fans shall be DWDI Centrifugal Type. Each fan assembly shall be dynamically and statically balanced. The blower(s) shall operate in Class-I range, shall be belt driven, and rated in accordance with AMCA Standard #210.

The drive set shall be of the variable pitch type. The belt(s) shall be sized for 200% of the motor horsepower rating, and shall be oil and heat resistant and static conducting.

The blower shall have permanently lubricated ball bearings. The blower shaft shall be cold finished center-less ground heavy-duty steel, treated for rust protection. The shaft shall conform to ASTM A-108 Specification.

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4.1 BLOWER MOTOR: The blower motor shall be Open Drip Proof, mounted on an adjustable base, provided with locking assembly to prevent motor play. The motor shall be 1725 RPM and shall have copper windings, phase isolation and shall be UL component recognized.

5.0 SCROLL COMPRESSOR: The unit shall utilize hermetically sealed high efficiency compressor(s). It shall employ an internal device to prevent reverse rotation upon shut down. In addition, the compressor shall be able to restart after a 5 second time delay without the aid of start assist device. The compressor internally shall have pressure relief valve, current overload and thermal protection. Complete with factory installed and wired crankcase heater.

6.0 REFRIGERANT SYSTEM: Each refrigerant circuit shall be provided with:

- Filter Dryer
- Sight glass
- Manually Reset High Pressure Switch
- Auto Reset Low Pressure Switch
- Schrader fittings for charging.
- Suction Accumulator
- Liquid Receiver

7.0 LOW AMBIENT CONTROL

7.1 LOW AMBIENT–HEAD PRESSURE CONTROL: The MAXI KOOL Unit shall be provided with LOW AMBIENT HEAD PRESSURE CONTROL-Limitizer System for low ambient below -30°F. Head pressure control valve is factory supplied and installed on the air cooled condenser. The head pressure control valve provides a condenser-flooding type of low ambient head pressure control.The liquid receiver shall be heated and insulated.

Under normal summer ambient design condition, the liquid side of the valve remains fully open and the hot-gas side fully closed, thus offering no interference with the design operation of the system. Under conditions of reduced loads and/or cold ambient temperatures, the liquid side valve remains closed on start-up, causing the condenser to flood, thus reducing the effective condenser surface area. Flooding continues until the condenser reaches the pressure of the valve setting. The gas side valve, meanwhile is open, allowing a portion of the hot discharge gas to flow directly into the receiver, maintaining in the receiver the high side pressure required for proper valve operation and prevention of compressor short-cycling. Once the desire pressure is reached in the condenser, the valve modulates to maintain adequate high-side pressure, regardless of outside ambient temperature conditions.

8.0 CONTROLS:

8.1 POWER PANEL: All high voltage electrical control components shall be located in an easily accessible control box mounted on the side of the unit. Terminal points shall be provided for field wiring & controls provided by others.

Each electrical component such as fan motor, compressor shall be individually protected with branch circuit fuses. The Control Panel shall contain:

- Fuse-block with Fuses
- Transformers
- Circuit breakers for transformers
- Contactors
- Ground connection
- Low voltage terminal block.
- Power Block

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TECHNICAL DATA
MAXI KOOL-AIR COOLED CONDENSING UNIT

COMPU-AIRE REFERENCE:	PA-5655-2
EQUIPMENT MODEL:	MKA-312 (C)
DESIGN AMBIENT TEMPRATURE	95°F
DESIGN ALTITUDE (FT. ABOVE SEA LEVEL):	5,300 FT.
No. of Ref. Circuits (Systems)	1
CONDENSER COIL CAPACITY: At 95°F Ambient Temperature @ 125°F CT, 40°F SST	
Sensible Heat Transfer Capacity-BTU/HR	30,078
CONDENSER COIL DATA-Aluminum Fins, 1/2" OD Copper tubing	
Face Area-Sq. Ft.	4.2
Rows/FPI	4/12
CONDENSER AIR FLOW DATA-Forward Curved Centrifugal Blower D.W.D.I.	
ACFM	2,250
External Static Pressure (Inch of Water)	0.3”
Motor HP	1.0
Quantity	1
COMPRESSOR DATA-Scroll	
Refrigerant	R-407C
Quantity	1
Size-Tons	2 (Two)
ELECTRICAL DATA @ 208V/1Ph/60Hz	
Full Load Amps (FLA)	20.0
Min. Circuit Ampacity (MCA)	25.0
Max. Recommended Fuse Size (MFS)	40A
PIPING DATA-All Connections are Copper O.D.	
Liquid Line	1/2”
Suction Line	5/8”
PHYSICAL DATA (CONDENSING UNIT)	
Length	45.00”
Width	32.00”
Height	24.00”
Unit Weight (Lbs.)	445

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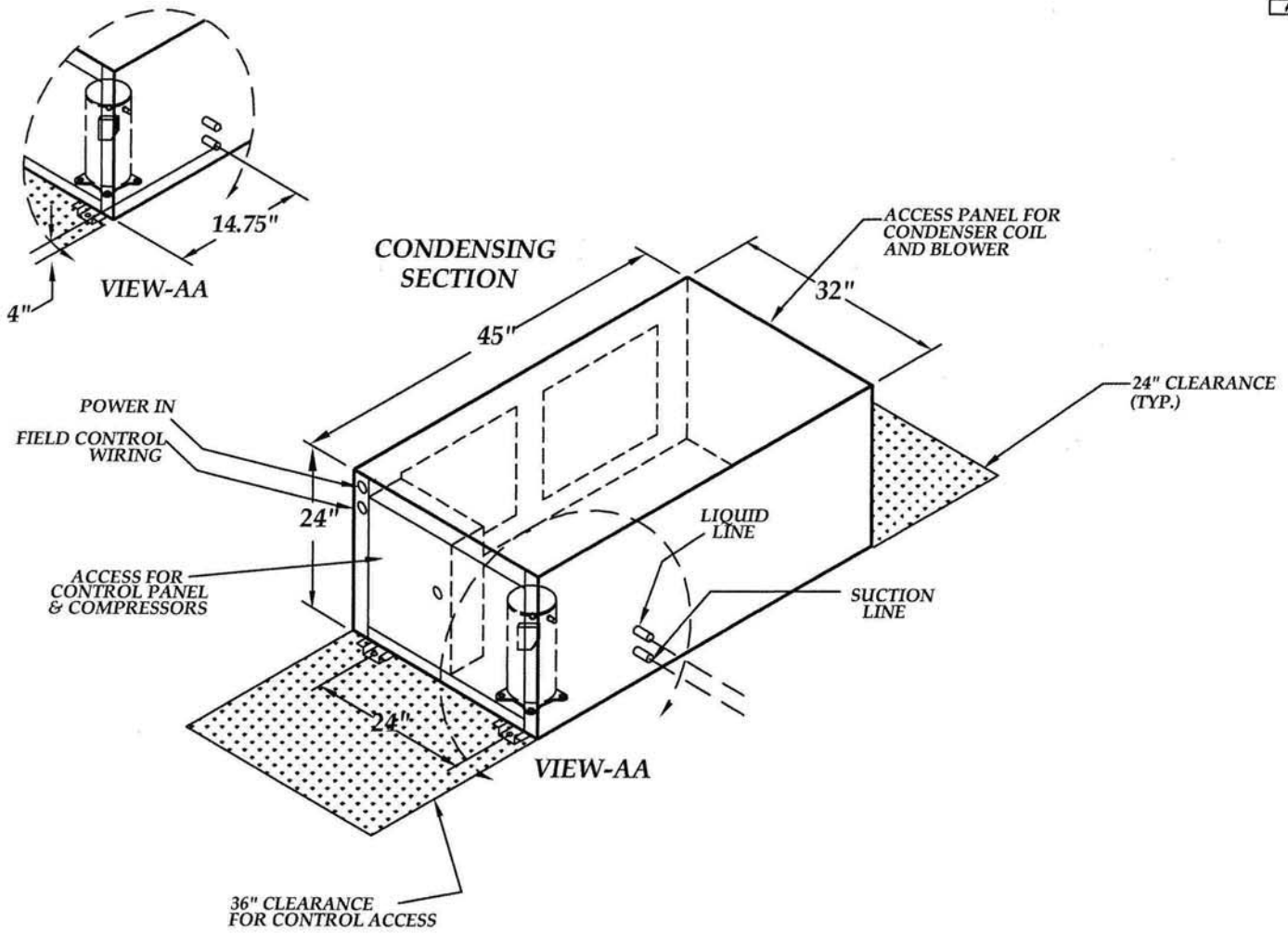
REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	NEW RELEASE	10/21/05	LD



MKA-3 (C)

COMPU–AIRE,inc.

MAXI-KOOL-AIR COOLED
CONDENSING UNIT

DRAWN BY M.BEDOLLLA	DATE 10/21/05
APPROVED BY:	REVISED
JOB NO.	DWG NO. 685-901-033X